What is claimed is:

1. A voltage-controlled tunable filter, comprising:

a plurality of coaxial combline resonators;

at least one of said plurality of coaxial combline resonators includes and at least one metallized through-hole;

an input/output coupling metallization on at least one surface of said plurality of coaxial combline resonators;

at least one tunable varactor associated with said plurality of coaxial combline resonators; and

an iris connecting said plurality of coaxial combline resonators.

2. The voltage-controlled tunable filter of claim1, further comprising at least one DC biasing point for providing voltage to said at least one tunable varactor.

3. The voltage-controlled tunable filter of claim1, wherein coupling between adjacent resonators is obtained via the aperture formed on a common wall between the resonators, and is controlled by the aperture size and position.

4. The voltage-controlled tunable filter of claim1, wherein said at least one input/output coupling metallization on at least one surface of said

at least one coaxial combline resonator is two input/output coupling metallizations on at least one surface of said at least one coaxial combline resonator.

5. The voltage-controlled tunable filter of claim1, wherein said voltage-controlled tunable filter is a coaxial block voltage controlled tunable filter.

6. The voltage-controlled tunable filter of claim1, wherein said tunable varactors include a substrate having a low dielectric constant with planar surfaces.

7. The voltage-controlled tunable filter of claim 6, wherein said substrate further includes a tunable dielectric film on the substrate comprising a low loss tunable dielectric material.

8. The voltage-controlled tunable filter of claim 1, wherein said input/output coupling metallization is metallized with a predetermined length, width, and gap distance and wherein a low loss isolation material is used to isolate the outer bias metallic contact and the metallic electrode on the tunable dielectric.

9. The voltage-controlled tunable filter of claim 1, wherein said tunable varactors are MEM tunable capacitors.

10. The voltage-controlled tunable filter of claim 9, wherein said MEM tunable capacitor utilizes a parallel plate topology.

11. The voltage-controlled tunable filter of claim 1, wherein said MEM tunable capacitor utilizes an interdigital topology.

12. A method of using voltage to control a tunable filter, comprising the steps of:

providing a plurality of coaxial combline resonators;

said plurality of coaxial combline resonators include at least one metallized through-hole and an input/output coupling metallization on at least one surface of said plurality of coaxial combline resonators;

varying the capacitance of a capacitor by using at least one tunable capacitor associated with said at least one coaxial combline resonator; and

connecting said plurality of coaxial combline resonators with an iris.

13. The method of using voltage to control a tunable filter of claim 12, further comprising the step of providing voltage to said at least one tunable varactor with at least one DC biasing point.

14. The method of using voltage to control a tunable filter of claim 12, further comprising the step of controlling the coupling between adjacent resonators by controlling the aperture size and position of said iris formed on a common wall between the resonators.

15. The method of using voltage to control a tunable filter of claim 12, wherein said at least one input/output coupling metallization on at least one surface of said at least one coaxial combline resonator is two input/output coupling metallizations on at least one surface of two coaxial combline resonators.

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16 ~~14~~. The method of using voltage to control a tunable filter of claim 12, wherein said voltage-controlled tunable filter is a coaxial block voltage controlled tunable filter.

17 ~~15~~. The method of using voltage to control a tunable filter of claim 12, wherein said tunable dielectric capacitors include a substrate having a low dielectric constant with planar surfaces.

18 ~~16~~. The method of using voltage to control a tunable filter of claim 15, wherein said substrate further includes a tunable dielectric film on the substrate comprising low loss tunable dielectric material.

17. The method of using voltage to control a tunable filter of claim 12, wherein said input/output coupling metallization is metallized with a predetermined length, width, and gap distance and wherein a low loss isolation material is used to isolate the outer bias metallic contact and the metallic electrode on the tunable dielectric.

18. The method of using voltage to control a tunable filter of claim 12, wherein said tunable varactors are MEM tunable varactors.

19. The method of using voltage to control a tunable filter of claim 12, wherein said MEM tunable varactor utilizes a parallel plate topology.

20. The method of using voltage to control a tunable filter of claim 12, wherein said MEM tunable varactor utilizes an interdigital topology.